BLM WYOMING WATER MANAGEMENT

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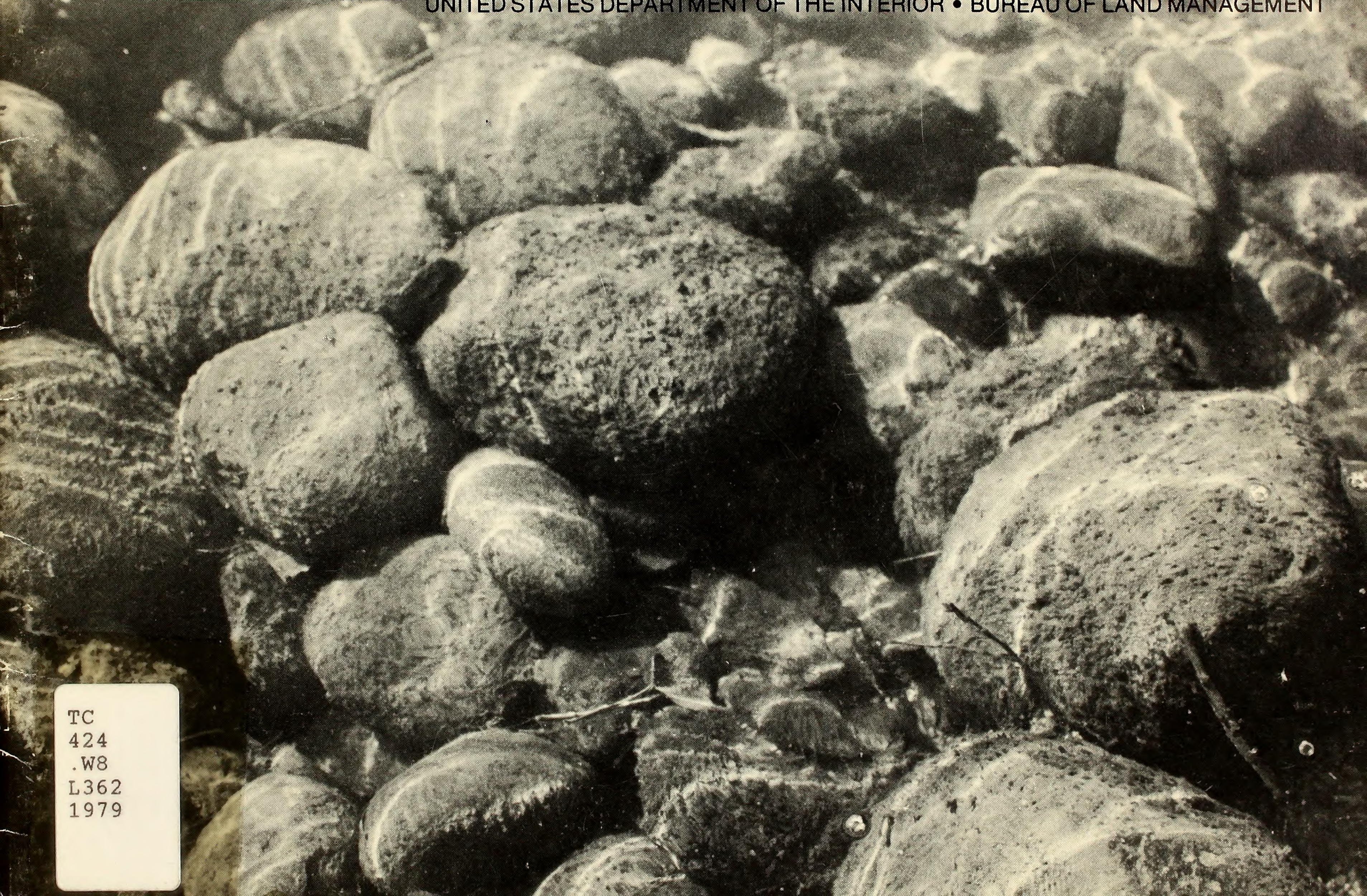

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Water is a limited resource in Wyoming. A growing list of interests depends on the availability of this water for present existence and future growth.

Because Wyoming's water is important to the state and the nation, the Bureau of Land Management has developed a plan to manage this resource to meet present and future needs.

This document explains the BLM Water Management Program, why it exists and how it operates. If you are interested in more information on this and other BLM programs, contact your nearest BLM District Office.

Dan Baker

Dan Baker
State Director

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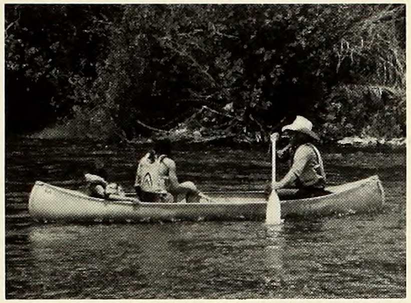

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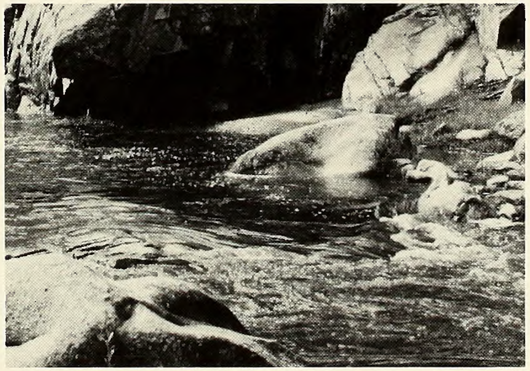


THE HISTORY OF WYOMING IS THE HISTORY OF ITS WATER

Explorers who came to chart the lands and drink in the natural beauty of the West once followed Wyoming waterways, and in their wake came hunters and trappers drawn by beaver, deer, elk and other abundant wildlife.

Following these early visitors came cattlemen who used the range of the ''Cattle Commonwealth'' to help build their empires. And then came sheepgrowers who turned available forage into wool.

Cities emerged in this frontier region, serving as trading and supply posts and centers of culture.

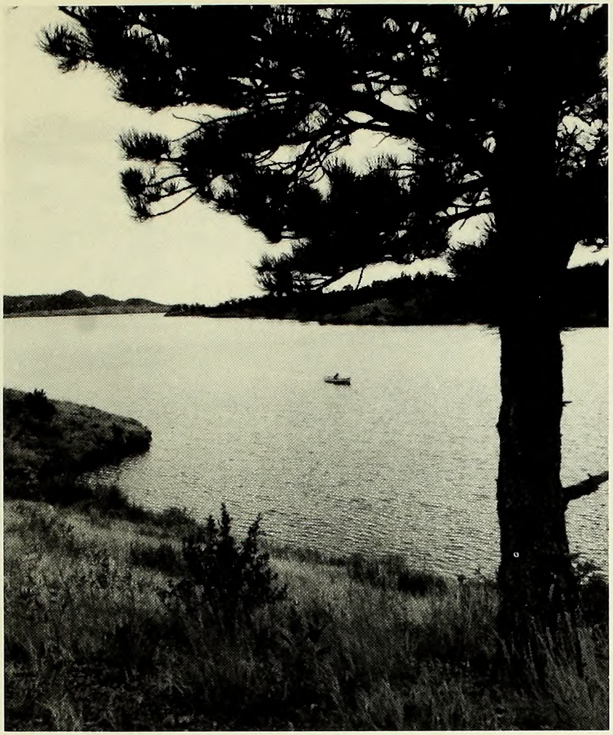
As the population increased, the need for food brought farmers to the region.

Throughout this period of early development, each fragment of Wyoming's history competed for and depended on water.

Even in the early stages of development the importance of water was clearly understood.

In the petition for statehood Wyoming reserved control and ownership of all water above, on and below the land. And this right to water was included in the agreement of statehood when Wyoming joined the Union in 1890.

With the passage of time, many aspects of life and industry in Wyoming have changed, but the importance of water has not. Annual rainfall of between six and 14 inches makes much of the state a high plains desert, and a growing list of interests compete for the limited water supply.

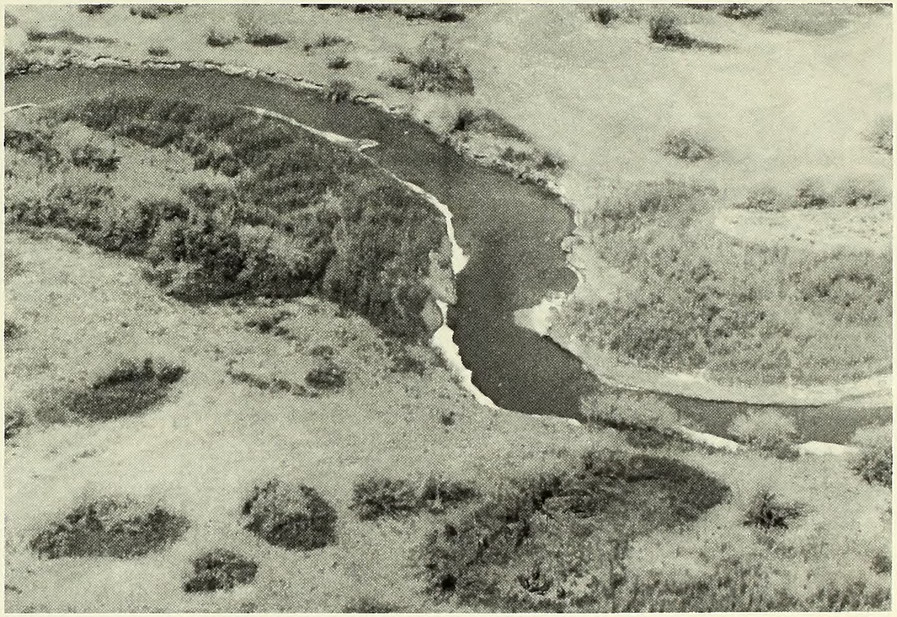


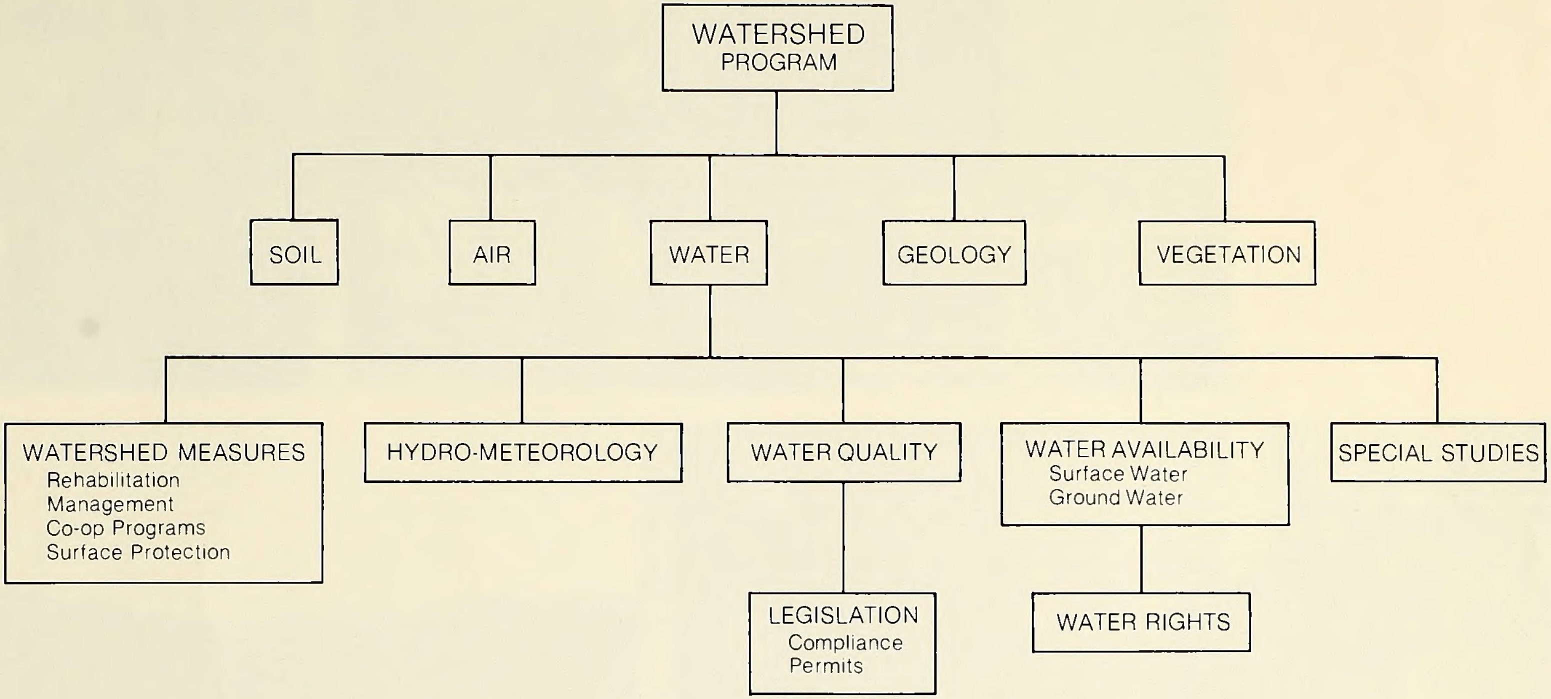
Livestock producers and farmers require water to help meet an expanding, worldwide need for food.

The burgeoning energy industry desperately needs water to develop Wyoming's coal, oil and gas resources to ease the nation's dependency on foreign energy.

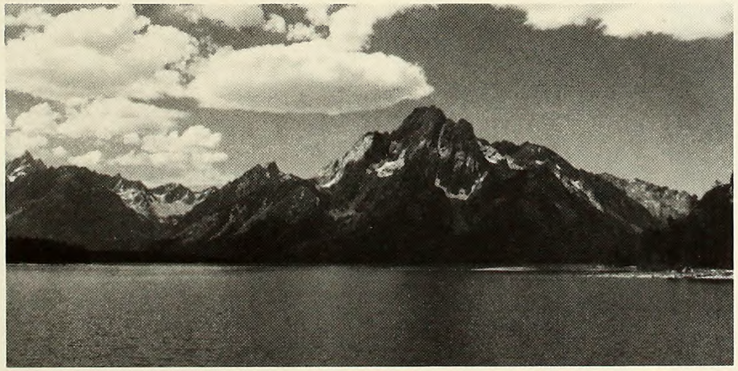
The state and the nation have become protective of the natural beauty, wildlife and recreation resources which are so much a part of Wyoming.

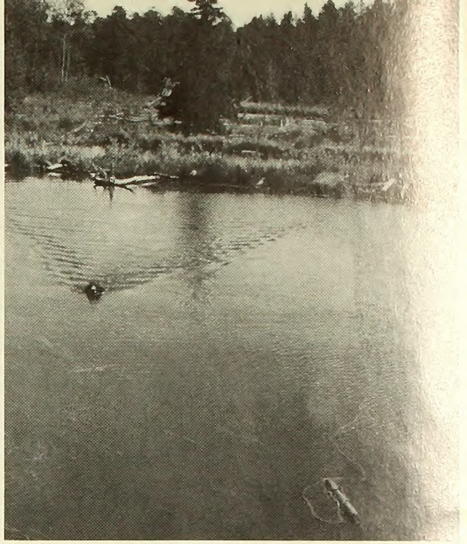
To help balance the many demands on this resource, the BLM has developed a program to help manage the water resource on all public lands in Wyoming.

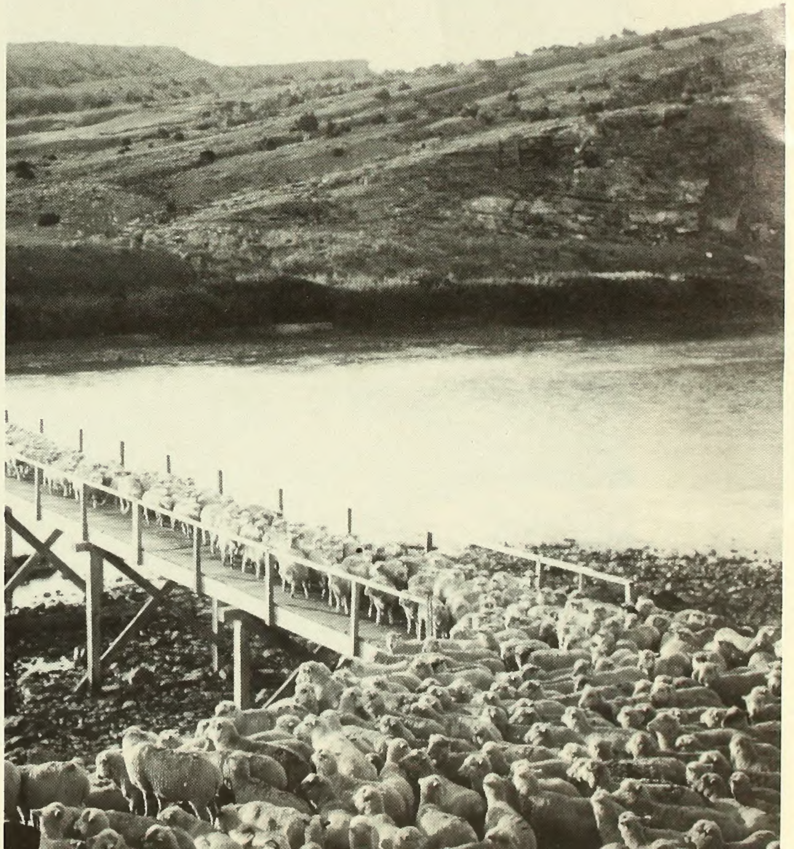


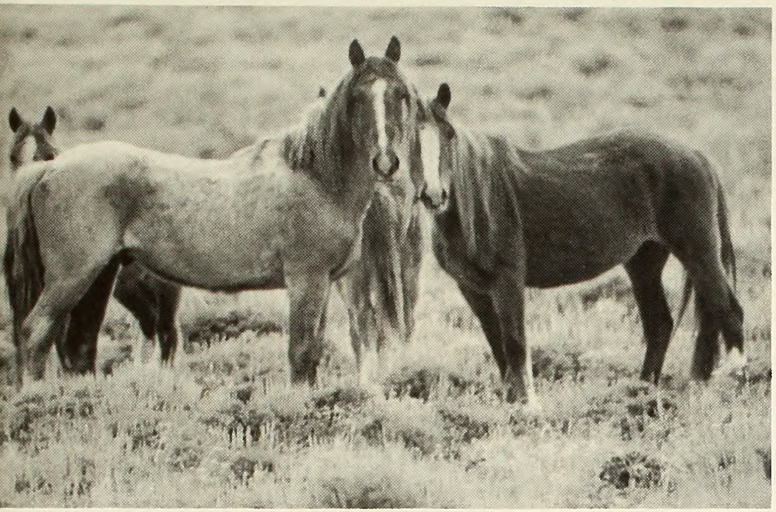


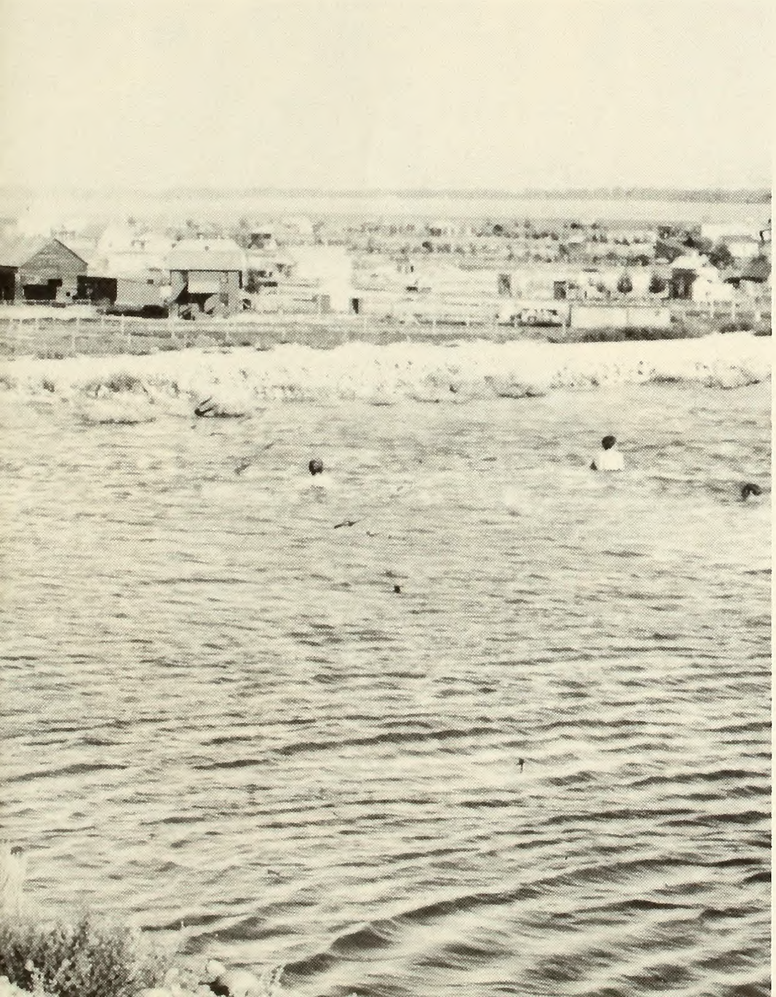
Water management is one component of the BLM watershed program.

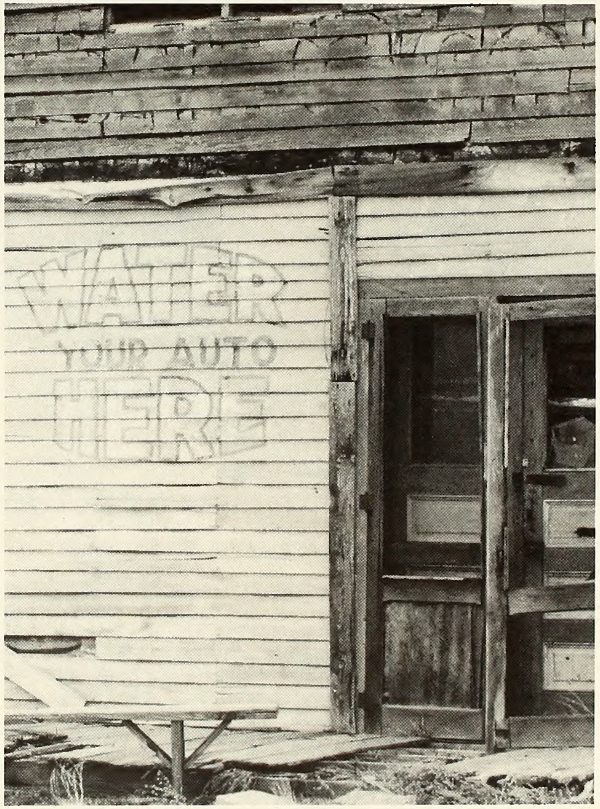








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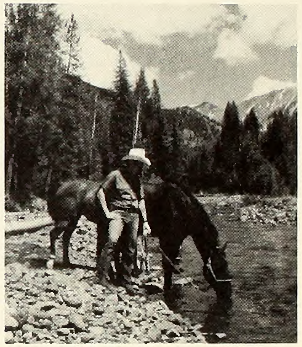
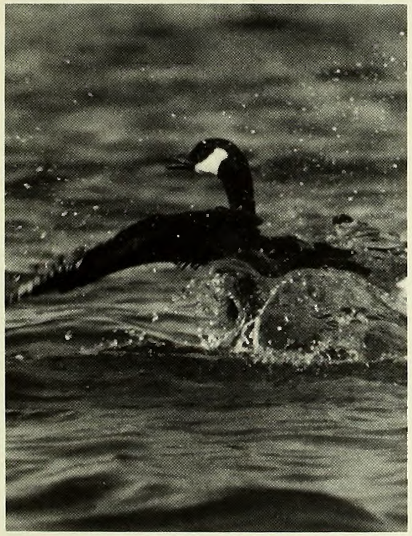


A PROGRAM TO MEET FUTURE WYOMING WATER NEEDS



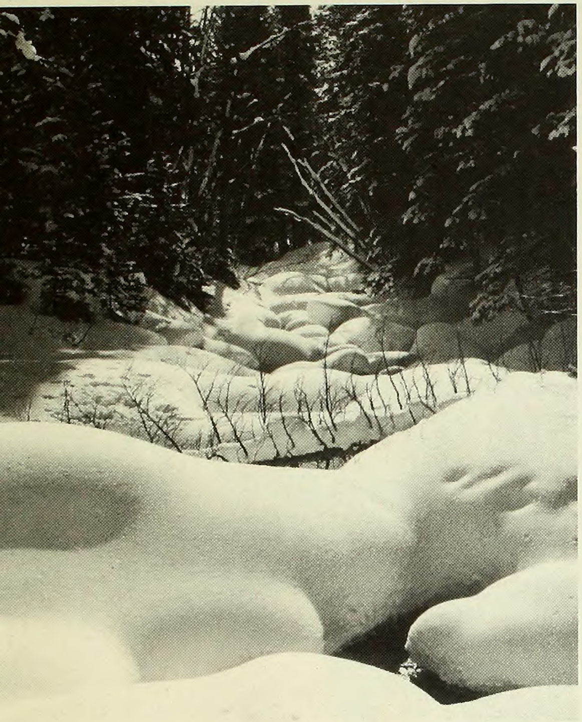
Because water is a basic resource, the Bureau of Land Management considers the wise use and protection of water in all its decisions and actions. The BLM oversees management of natural resources on 17.8 million acres in Wyoming, an area that contains 50 percent of the state's water. To help use this water wisely and protect it, the BLM in Wyoming has developed a Water Management Program to increase and improve water supplies and to protect water resources in future years.

Bureau policy provides for a wide range of water uses on public lands. It requires, however, that any proposed use first be evaluated to avoid unacceptable damage to the environment or risk to the public health and safety. Goals for land use planning and management on lands administered by the BLM are:

- to assure multiple water use and sustained yield
- to maintain water quality equal to or above legal standards
- to collect water resource data needed for sound planning
- to comply fully with applicable laws and regulations.

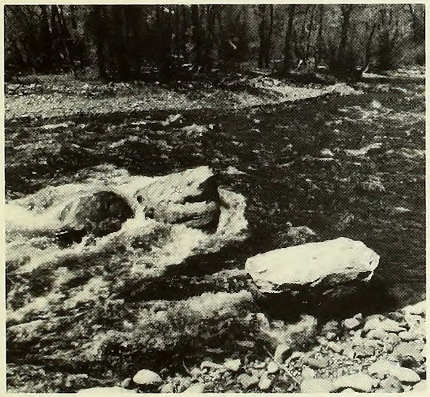
Comprehensive Services Protect the Water Resource

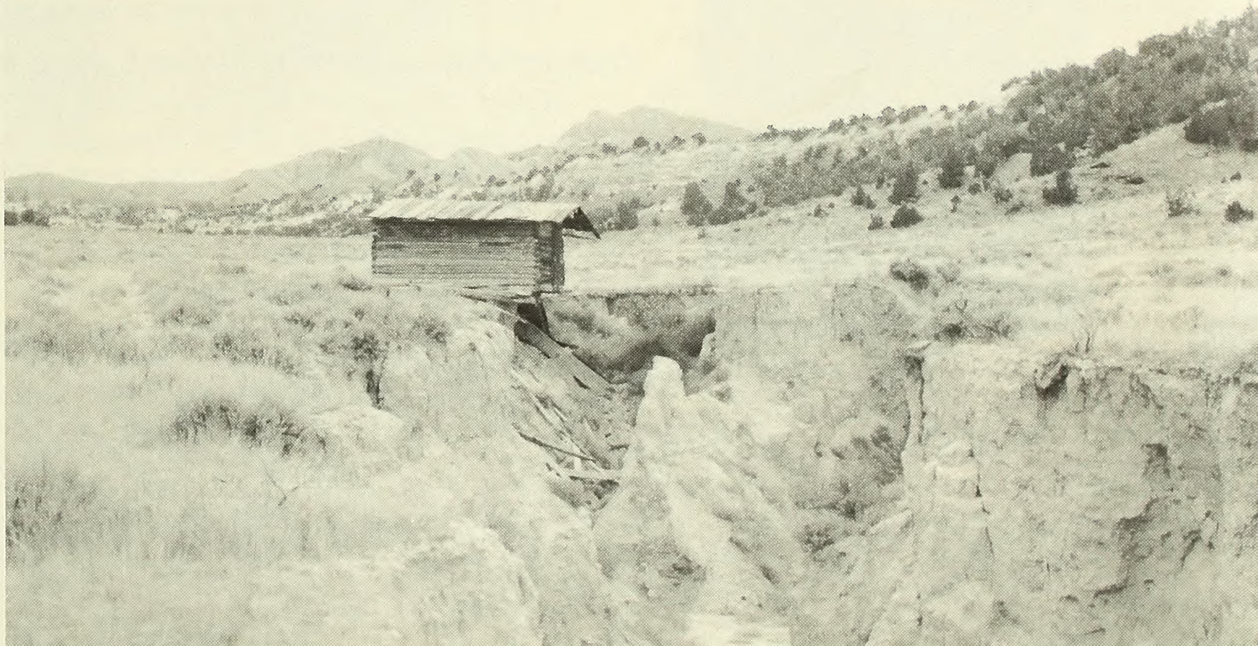
Historically, Wyoming has lacked comprehensive water quality information. The Water Management Program is designed to provide the basic water resource information, planning and management services which are necessary to maintain and enhance water resources. These activities help managers in all Bureau programs realize how their decisions may affect water supplies and quality, and to understand the relationship of water to wildlife, recreation, range and other resources that depend on water.

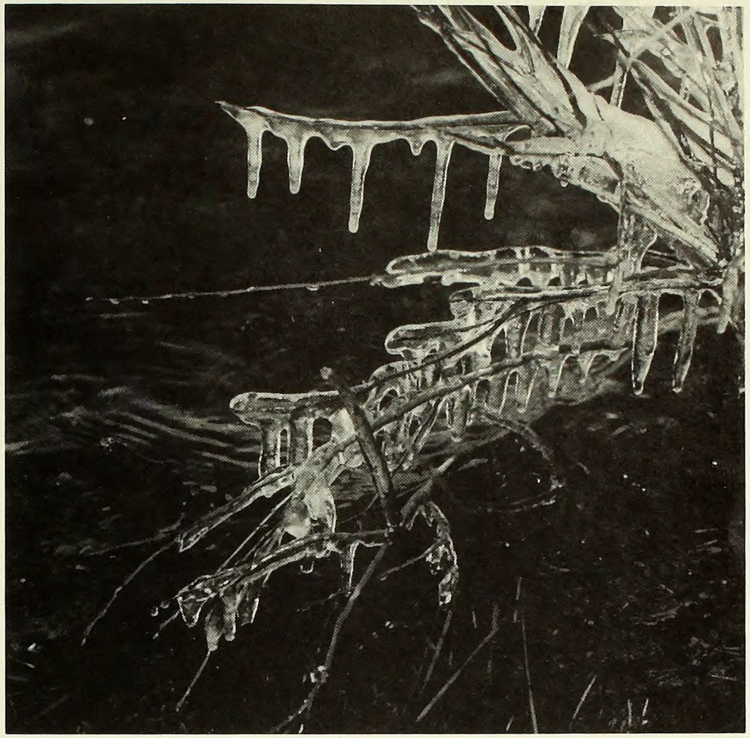


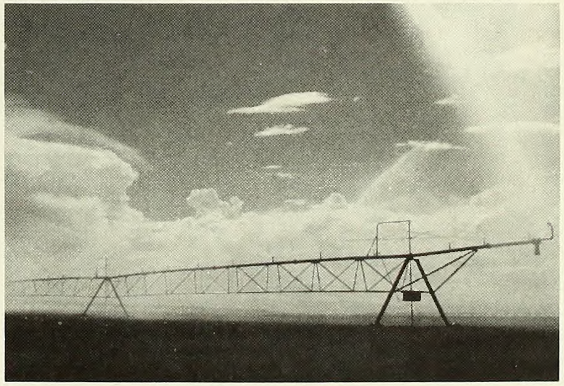
Specific objectives of the Water Management Program are to:

- provide water resource information and hydrologic services to help meet federal, state and local water resource requirements.
- provide the skills needed to make watershed inventories, plans and management decisions.
- protect water supply requirements for all BLM resource uses.
- inventory all water resources associated with public lands, and interpret this data.
- comply with all federal and state laws which protect the quantity and quality of water resources.
- coordinate Bureau Water Management Program activities with federal, state and local agency representatives.
- help staff specialists and resource managers apply water resource information.
- provide training for professional, technical and management personnel.









JOBS OF THE WYOMING WATER MANAGEMENT PROGRAM

The Water Management Program involves seven major jobs which are performed by hydrologic and watershed scientists.

Water Management

BLM applies water resource management techniques to the development of land use and natural resource programs and plans.

Water Resource Investigations

Water resource investigations inventory water quantity and quality information which is used to evaluate management activities and to predict the impact of proposed activities on land resources.

Disaster Surveys

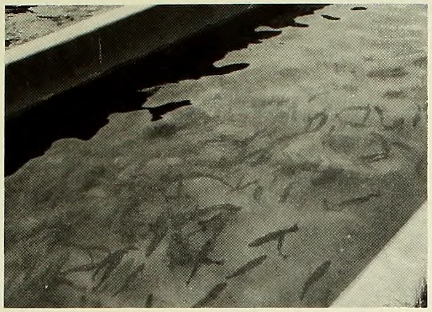
Following fire, flood or other disaster, BLM personnel identify damage in watershed areas and suggest actions necessary to restore lost water resources and avoid future disasters.

Water Quality Management

BLM develops water management practices that will meet water quality standards. Management at this level involves coordination with state water quality programs.

Small Watershed Studies

Bureau scientists study the cause-and-effect relationship between management practices and the water resource. This function is called the small watershed study and can serve as a bridge between what researchers advise and the outcomes that result when water managers implement such recommendations.

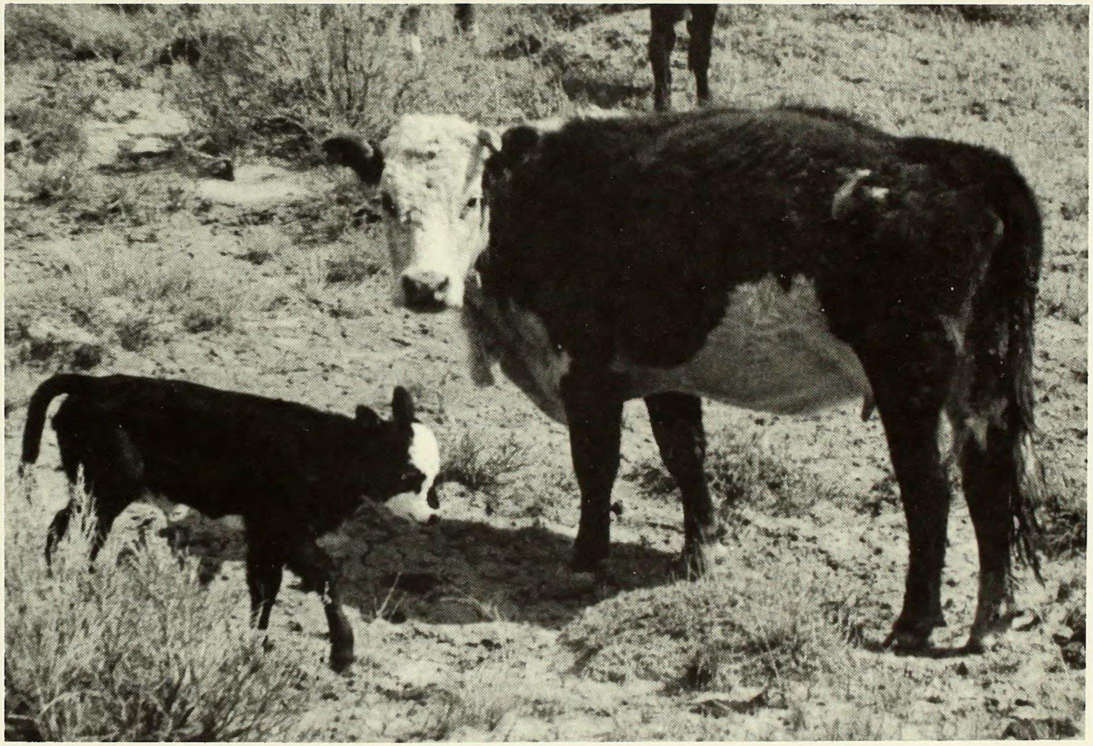


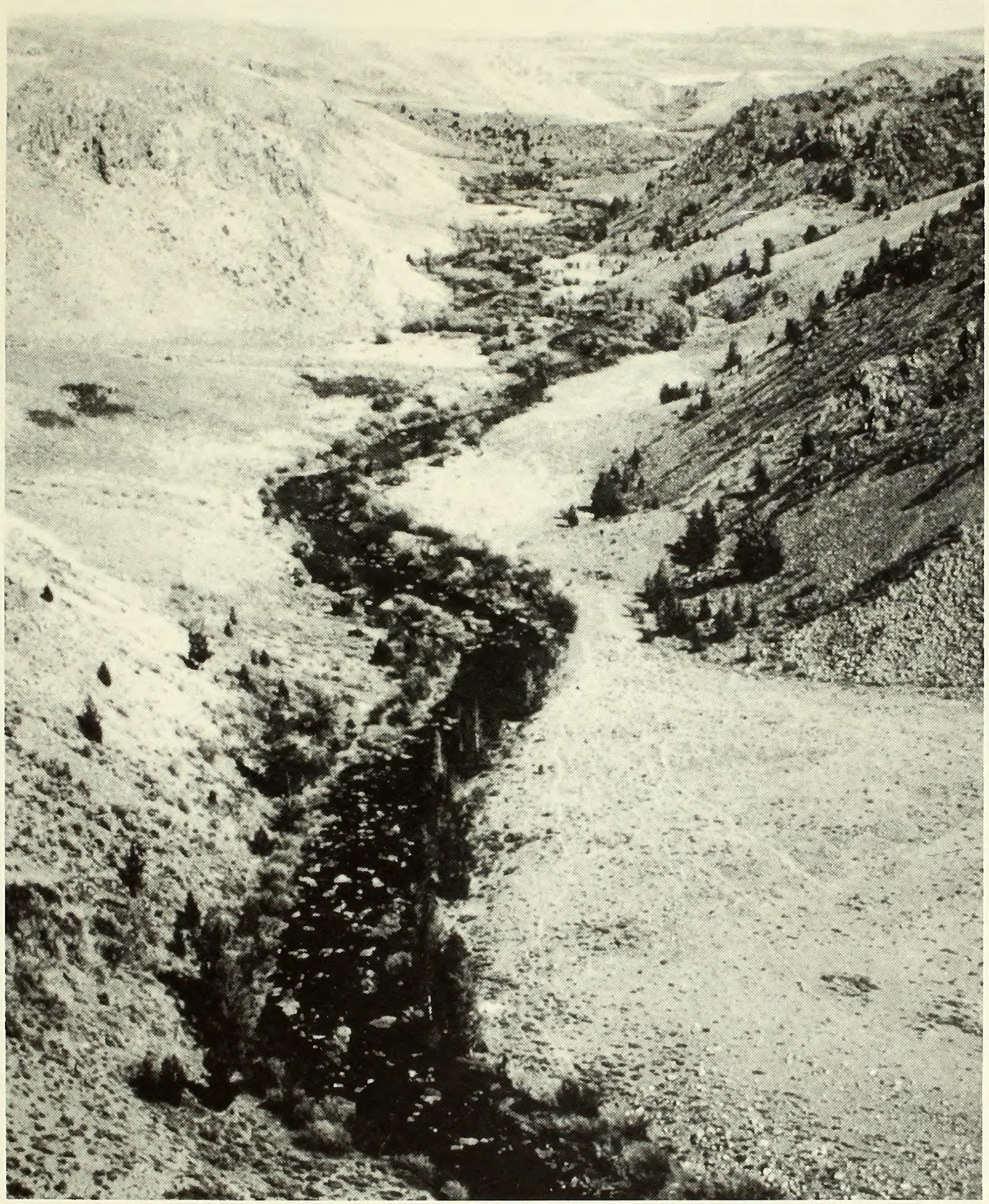
Internal Coordination

BLM transforms technical data into information that managers can understand and use. In this way decision makers are made aware of the risks involved in various land use options. BLM personnel are trained to apply water resource information in all areas that affect use of the land and its resources.

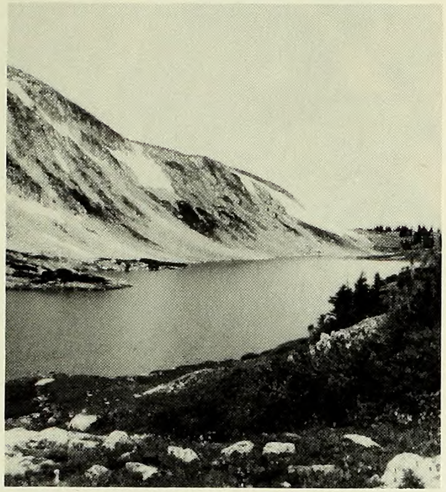
Coordination With Agency and Industry

To solve problems with a minimum of confusion, the BLM coordinates its water management effort with federal, state and local agencies, and also with research and industry representatives. This approach avoids duplication of effort among organizations.





HOW THE WYOMING PROGRAM WORKS



Bureau of Land Management activities include responsibility for watershed, forestry, lands, minerals, range, wildlife and recreation values. Each area is concerned with water as a resource.

The Wyoming Water Management Program is involved with each of the areas and provides two types of service—Support and Operation Activities.

The following sections explain in more detail activities of these support and operational segments of the BLM Water Management Program.

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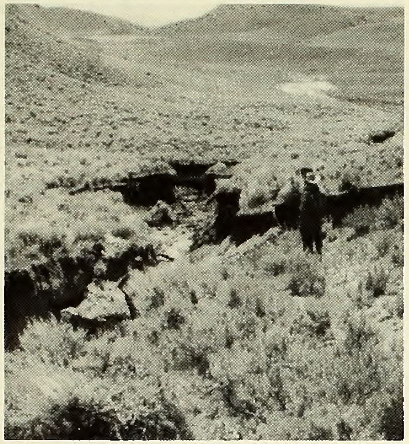
SUPPORT SERVICES



The support segment of the Water Management Program interprets scientific knowledge and provides a sort of "consulting service" which Bureau land managers can use to make management decisions about the sound use of water resources.

Support activities are the variety of services that water management personnel supply to all areas of BLM activity. These services may take the form of advice, counsel, or the design of specific programs related to the many facets of water. The information and recommendations usually take the form of written reports presented to management in the various areas. Following are examples of the several forms of support activities.

Watershed

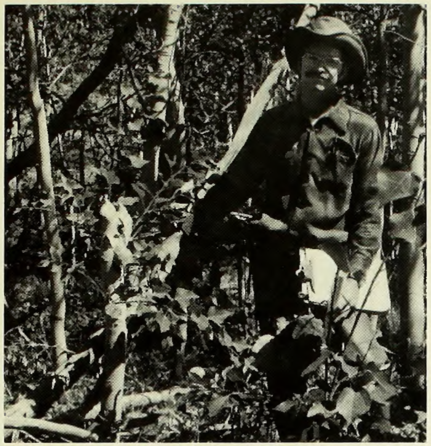
The Watershed Program is concerned with the protection, enhancement and rehabilitation of soil, air and water resources.

The Water Management Program provides the following support services to the Watershed Program:

—hydrologists conduct on-site investigations to analyze what activities a given piece of land can support. They determine the risks involved and ways to minimize these risks. Water quality standards are specified and ways are identified to maintain that water quality.

—personnel evaluate watershed areas which have been destroyed by fire and recommend measures to restore these lands to protect water values.

—personnel also investigate how herbicides and fertilizers affect water quality.



Forestry

The Bureau Forestry Program strives to manage forest areas in a manner which protects or improves the timber resource. This program seeks to utilize timber in an economical manner and at the same time protect other resources on the land, including water.

Water management interacts with the Forestry Program in the following ways:

—as with the watershed program, water management personnel may examine a site and analyze potential uses and capabilities. At the same time they determine the risks involved and the ways to minimize these risks. Also included in the site evaluation is a determination of water quality standards and a method of ensuring that these standards are met.

—when use of a forest area requires roads or other disturbance to the land, water management personnel assess how the disturbance will affect water quality. They also may recommend a plan or revegetation of the area, and suggest ways to monitor water quality.

—when timber is harvested, unused portions of the trees and other ground clutter called ''slash'' remains. Program personnel determine how treatment of this slash could affect water quality in downstream areas.

—personnel also determine critical soil moisture periods and recommend ideal times to plant trees as part of reforestation programs.

Lands

The objective of the BLM Lands Program is to oversee the use, occupancy and development of public lands. This is done within the framework of existing laws. The Lands Program typically is involved with making public lands available for government programs and private use—including agriculture, urban, suburban, commercial, industrial and recreational uses.

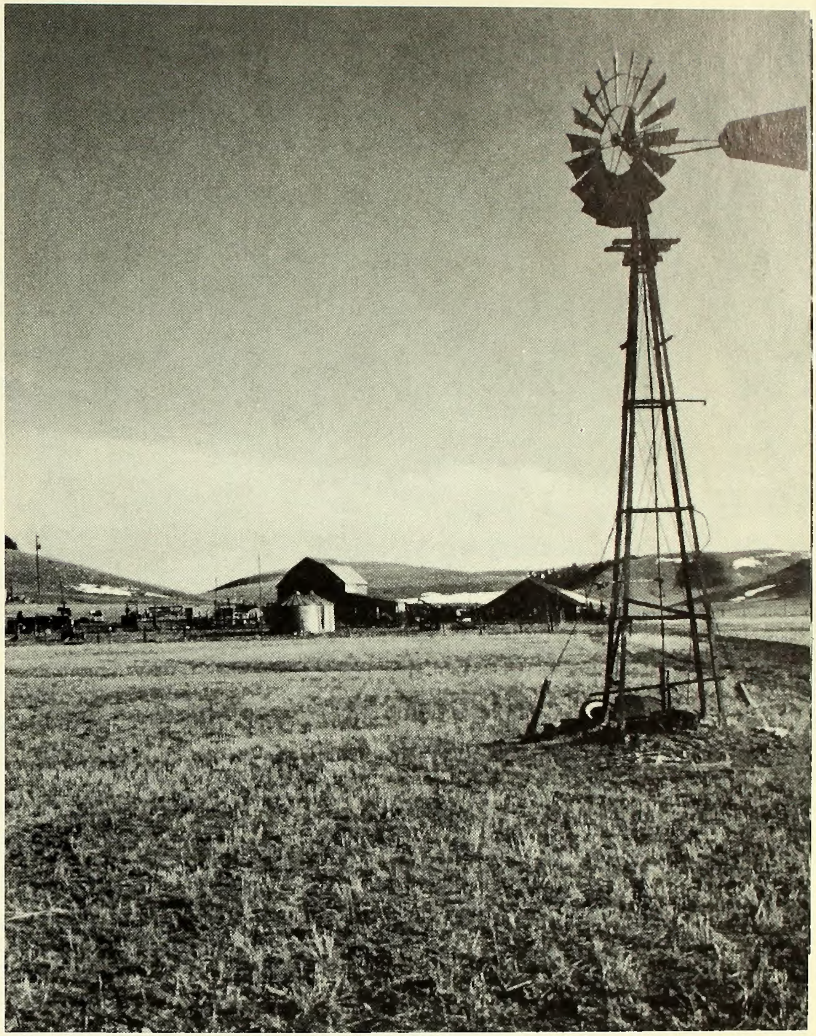
The Water Management Program assists the Lands Program in the following ways:

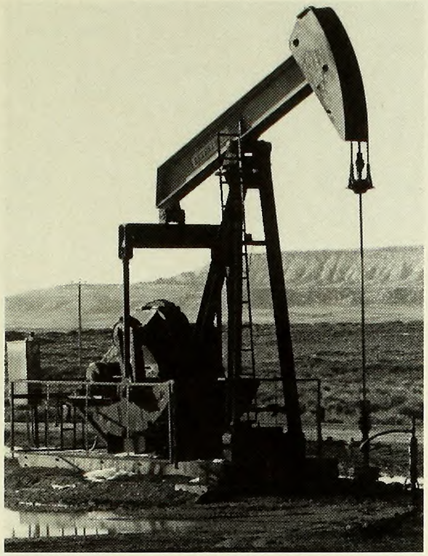
—personnel identify flood plains and other areas which might be affected by high water tables and periodic high water.

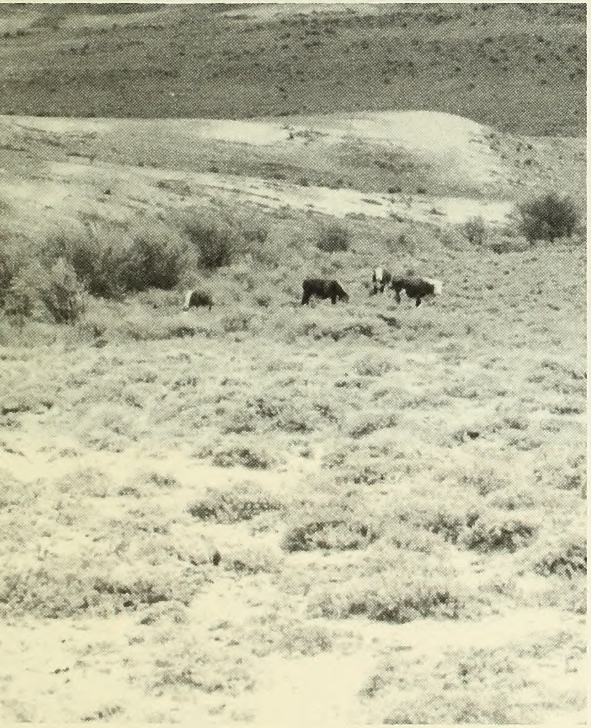
—hydrologists determine the availability of water both on and below the surface and use this data to classify the land for certain uses. Is land suitable for agricultural use, for example, or should it be entered as desert land?

—personnel determine land use restrictions and stipulations based on the potential effects on water quality and quantity.

—personnel establish requirements which must be met before requests can be considered for special uses of public lands.







Minerals

The Minerals Program facilitates the production of minerals from federal lands. Three factors guide this program: timely and orderly development of mineral resource, adequate payment for the resource which is removed, and protection of the environment from which minerals are taken.

Water management personnel support the Minerals Program in these ways:

—determine the potential impact of proposed mineral developments and recommend ways to minimize adverse effects. Such recommendations may extend to water flow patterns, the quality of water on and below the ground, changes in the characteristics of the aquifer and existing stream channels.

—help locate potential water sources for use in mineral development and processing.

—determine how much water will be needed to reclaim a developed area.

—review recommendations for the reclamation of potentially valuable mineral lands.

—recommend ways to ensure proper quality control of mining, mineral processing, and waste disposal activities, and methods to monitor quality control.

Range Program

The Range Program evaluates and manages the range resource on public lands. This range resource may be utilized either by domestic livestock or by wild horses and burros.

Water Management Program can provide support to the Range Program by taking these actions:

—visit areas and analyze the capability of the land to support grazing animals and to determine potential risks to water in the area. Investigators also recommend ways to minimize these risks and monitor water quality.

—determine the amount of available water in an area so that grazing plans can be realistic.

—interpret significant weather data to help determine the productivity of a particular land area.

—help determine the effect livestock might have on the many aspects of water both in the area and downstream.

—help distinguish the impact of livestock on water from the impact of natural geologic occurrences.

Wildlife

The Wildlife Program exists to protect and improve wildlife habitat on public lands. BLM managers in this activity try to provide areas which will support adequate numbers of a variety of wildlife species.

Water management activities which support the Wildlife Program include efforts to:

—determine the availability of water and the number of animals the land can sustain. This information can be used when habitat management plans are developed.

—supply information about the potential and quality of water in an area being considered for habitat improvement. If the improvement plan indicates a need to disturb the land, water management personnel can recommend measures that will minimize risks to water in the area.

—analyze the chemical quality and the amount of water available in an area and suggest what types of plant and animal life the water will support.

NOTICE
ALL VISITORS PLEASE REGISTER
NOTICE
THE PLATTE RIVER IS PRESENTLY UNDER AN INTENSIVE
RECREATIONAL STUDY. WE NEED YOUR COOPERATION
IMPORTANT INFORMATION CONCERNING YOUR VISIT
OF YOUR VISIT. PLEASE FILL OUT ONE CARD PER
IT IN THE BOX PROVIDED.
YOUR HELP IS APPRECIATED. THANK
Deposit Here
Take One

Recreation

The Recreation Program of the Bureau exists to manage recreational activities on public lands. This program also is charged with protecting the cultural, scenic and natural historic values of these lands.

In support of the Recreation Program, water management personnel are responsible for the following activities:

—monitor water quality in recreational waters and in areas downstream from these waters.

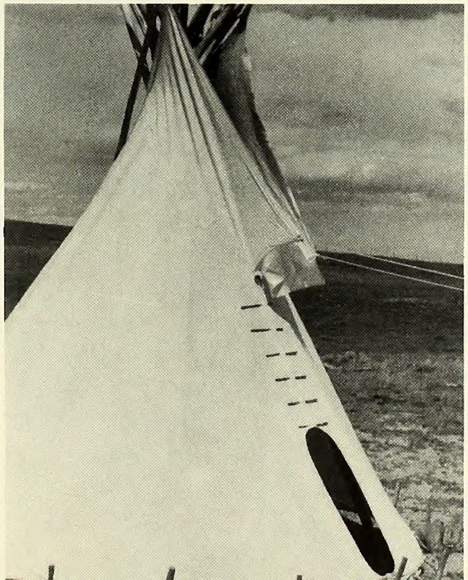
—identify water resources which could be developed for recreational use, and at the same time spell out possible risks in such development.

—supply recommendations which can be used in the selection of wilderness areas, or the classification of wild or scenic rivers.

Cultural Resources

The Cultural Resource Management section inventories, evaluates and protects cultural resources on public lands.

The Water Management Program can provide historical data on stream flow and water bodies to help locate valuable cultural resources.

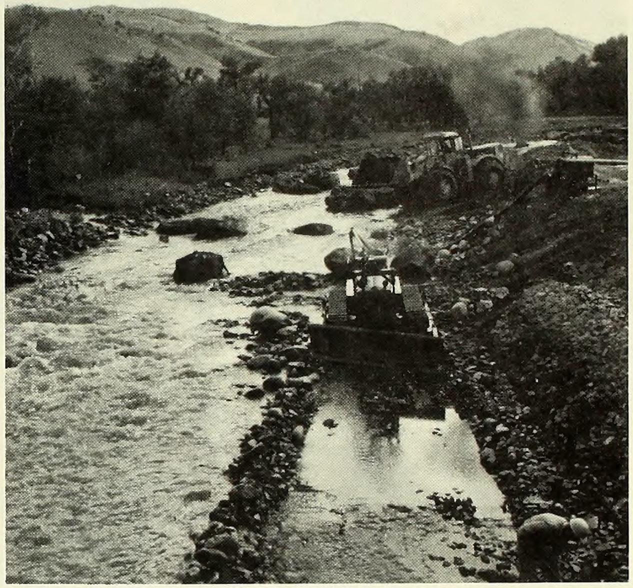


Engineering

The Engineering segment of the Bureau uses data from the Water Management Program to plan the construction of reservoirs, water facilities, recreational facilities, roads and buildings.

Emergency Rehabilitation

The Emergency Rehabilitation Program calls upon the Water Management Program to provide water resource data needed to rehabilitate lands which have been damaged by flood and fire. The Water Management Program also can locate flood plains and other areas likely to be damaged by floods.



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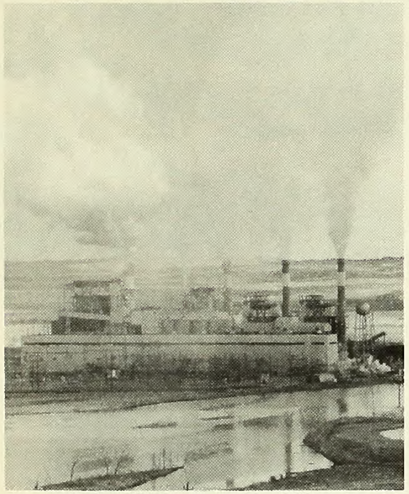
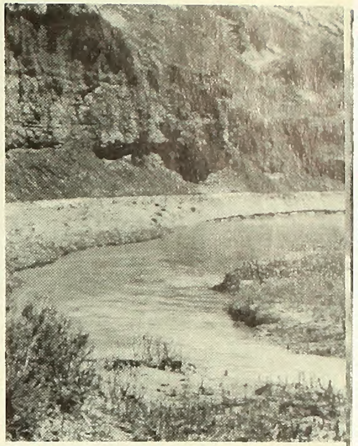
ACTIVITY OPERATIONS



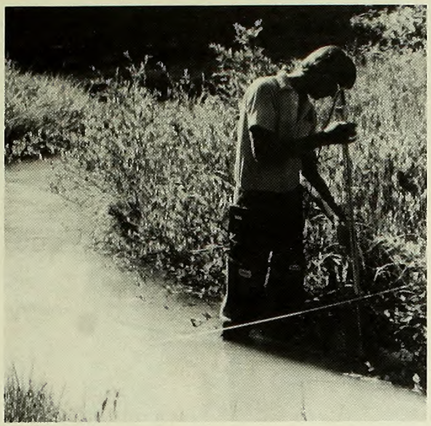


In the Activity Operations phase of the Water Management Program, personnel seek to determine through inventories how much quality water is available, and to protect and increase the quality of water resources affected by BLM activities. Sound land management decisions are formed as each Bureau activity draws on results of these efforts.

To systematically gather statewide water information, each district makes inventories in its areas of available water, the quality of drainage basin water and its relationship to land management activities. Additionally, each district investigates current water allocations and conducts a watershed rehabilitation program. This phase of the program requires each district to conduct specific activities.

Water Management and the Bureau Planning System

The first requirement of the Water Management Program is to provide a continuing basic inventory of water resource data. This information is used by *all* Bureau activities to identify alternatives for resource development and protection. The information is then combined with social, economic, legislative and policy concerns to determine which alternatives become part of the Water Management Program. The data base also is used to construct an ecological profile of each district. The data base is housed at the University of Wyoming with the Water Resources Research Institute. It is referred to officially as the "Water Resource Data System." The Bureau also is developing a *total resource* data storage and retrieval system. When it becomes operational, this system and systems from other government agencies will be used to provide additional support.



Water Resources Investigations

Water resource investigations provide the data used to determine water yield and quality. These investigations encompass associated watershed conditions, stream channel stability classifications, and potential water quality and quantity.

BLM uses the U.S. Geological Survey (USGS) as the principal source of surface and subsurface hydrologic data, since the USGS is responsible for coordinating water activities of all federal agencies. Other important sources of water information include various state and federal agencies.

Another part of the BLM's role is to identify what data are needed, to interpret these data and to develop data collection studies in three broad water resource categories:

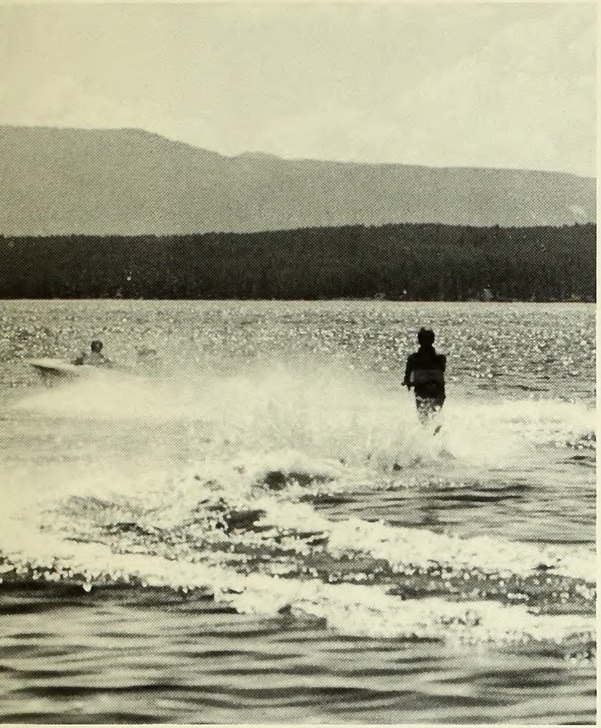
SURFACE WATER: knowledge of surface flows is required to predict hazards and to determine land use limitations and potentials.

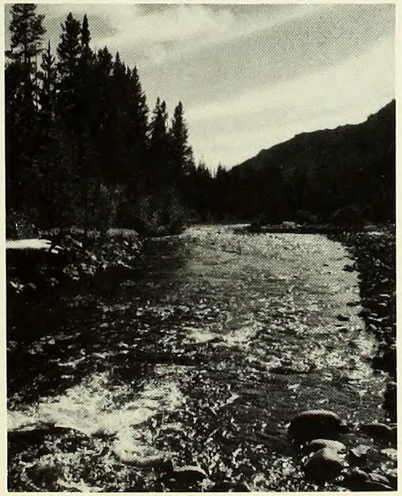
GROUND WATER: knowledge of subsurface water is required to determine what effects existing and proposed land uses may have on future water resources.

CLIMATOLOGICAL INVESTIGATIONS: knowledge of precipitation patterns in Wyoming is required to understand how much water is available to plants and to surface and ground water systems. Also important in climatological investigations is the study of air temperature, evaporation potential, wind movement and related variables.

Water Quality

National legislation provides the framework for BLM's responsibilities in Water Quality Management. Of particular importance is the Federal Clean Water Act and its amendments.





This act provides in part for the cleanup and protection of navigable waters and requires a water quality suitable for fish, wildlife and recreation. The act sets forth compliance deadlines through the 1980s.

Also important to the BLM in land use planning is information about chemical pollutants in ground water, possible pollution from geothermal steam, deep-well injection of solid and liquid wastes, and changes in recharge or discharge zones caused by aquifer depletion.

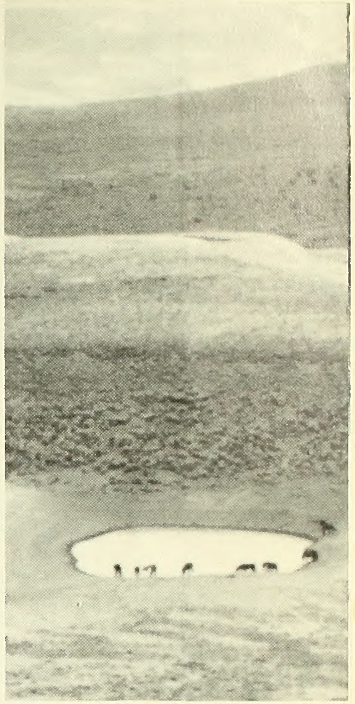
The Water Management Program includes input from federal, state and local agencies. All are involved in water quality management planning and in formulating associated rules and regulations.

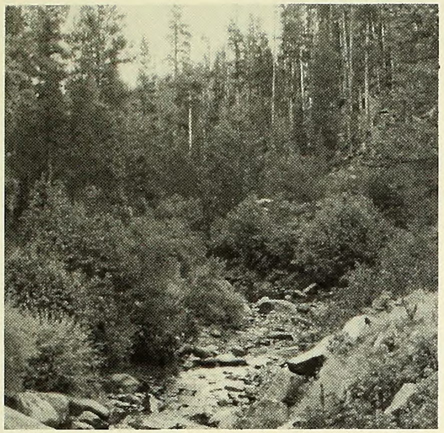
Water Uses and Rights

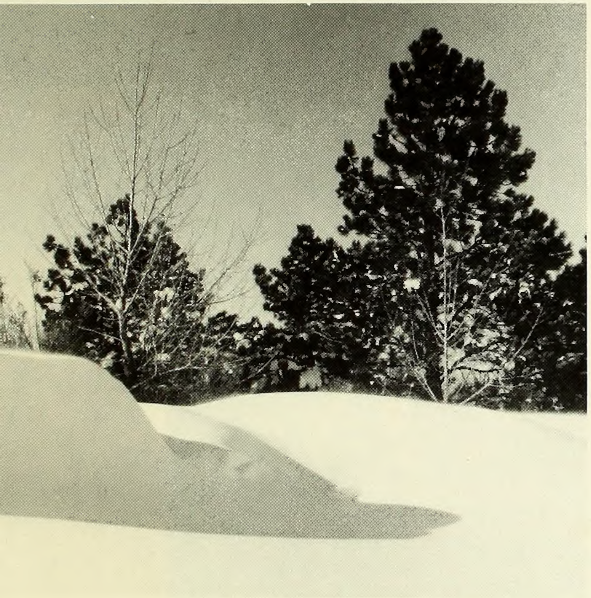
The State of Wyoming has jurisdiction over allocation of all waters of the state. The Water Management Program ensures that water is available for those resources that depend on water for development. These activities include obtaining the legal rights and reservations to both surface and subsurface waters that are needed to develop, use and manage the resources on public lands.

Instream Flow Needs

Certain resources depend for their survival on water flows or conservation pools. Serious depletion of these flows or pools could not only destroy valuable land and water habitat, but cause unacceptable levels of pollutant concentration. It is therefore essential that the Water Management Program identify instream flow and conservation pool requirements and provide for these needs through proper land management.





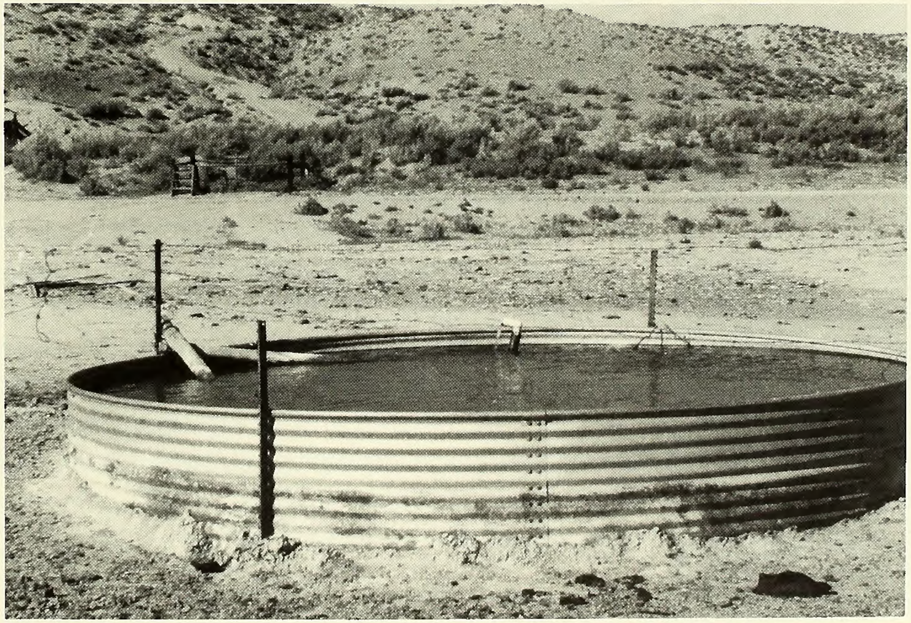


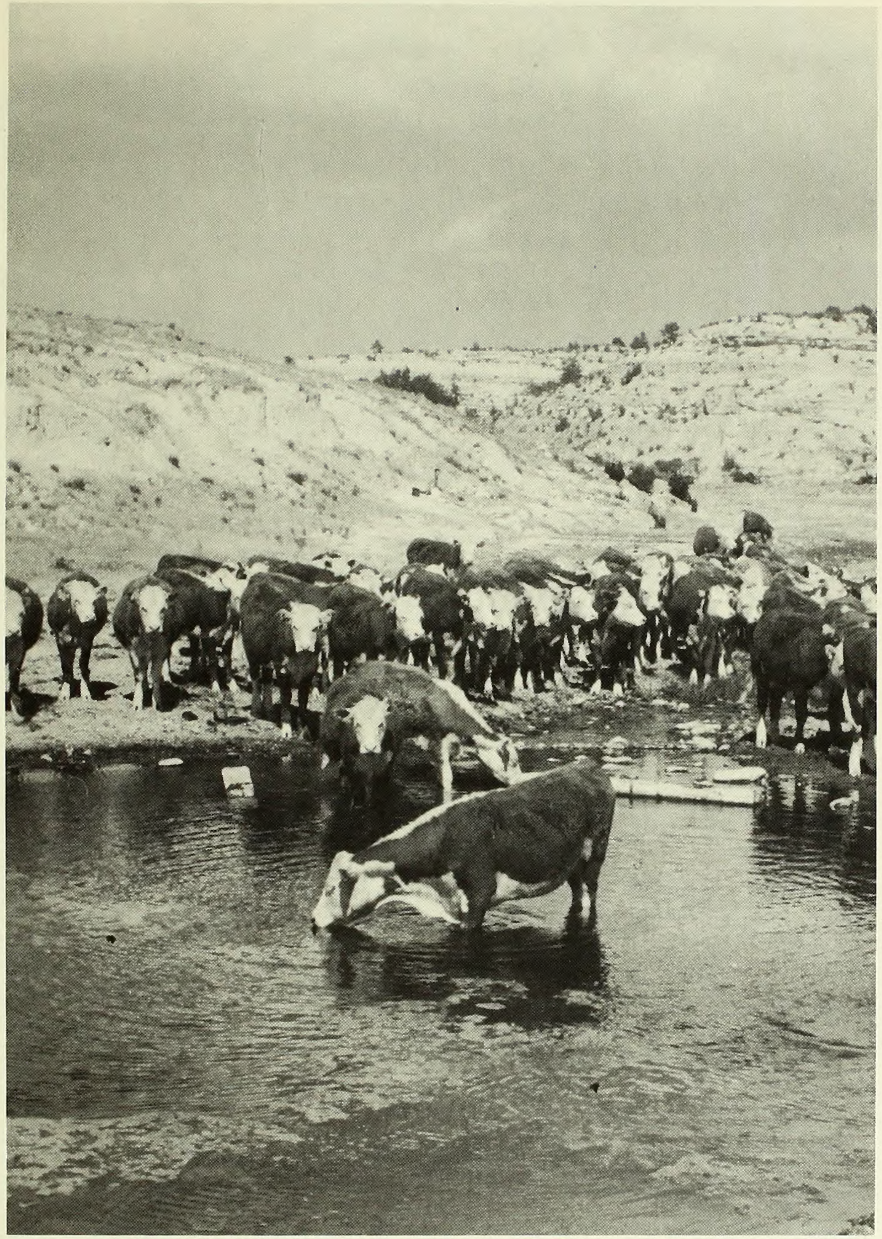
Watershed Rehabilitation and Maintenance

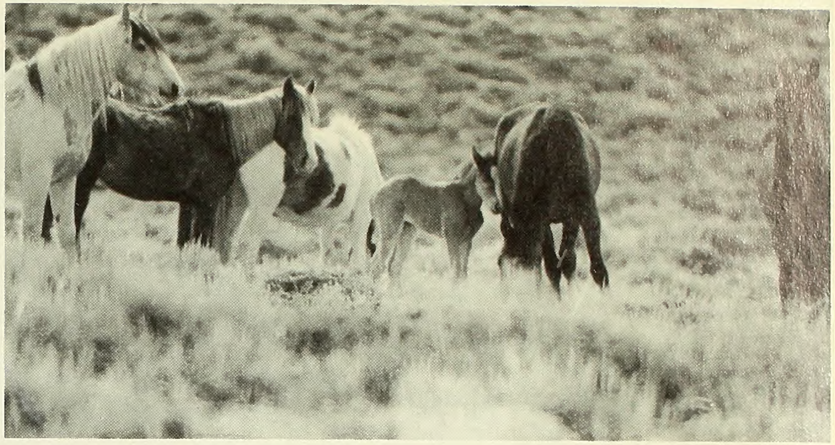
Until the mid-1960s, the BLM Watershed Program called for minimum range improvement work. Emphasis was on large water control structures—dikes, dams and diversions—to reduce sediment discharge into streams. This approach began to change in the mid-1960s with a new emphasis on range management concepts.

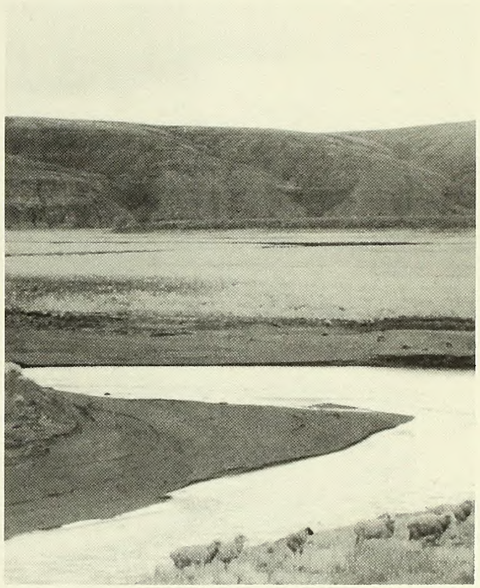
In fiscal year 1976, range improvement activities were shifted from the Watershed Program to the Range Program, and a new, more comprehensive watershed program was developed to protect and enhance soil, water and air resources.

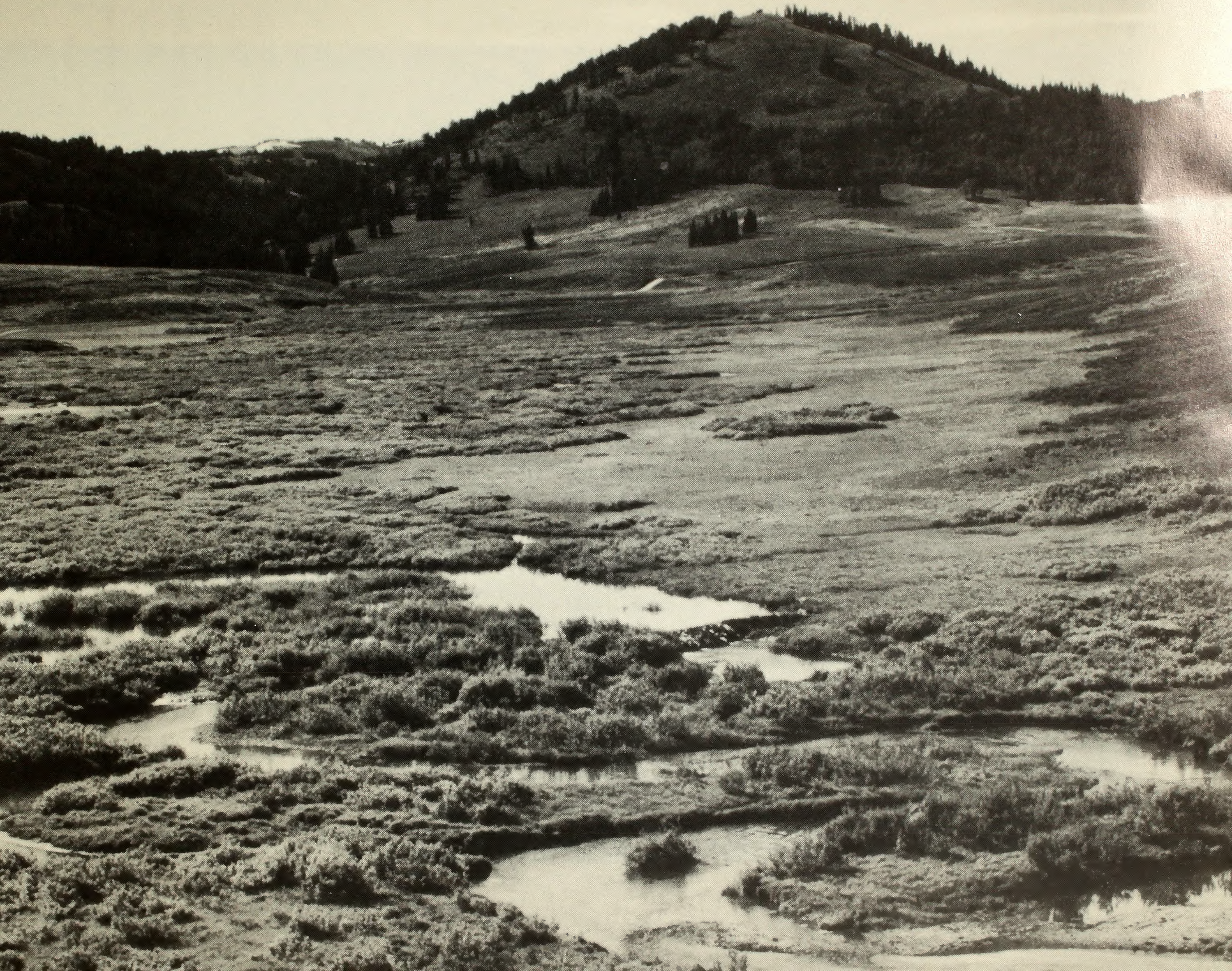
This part of the program calls for input to the Watershed Program from an interdisciplinary team of hydrologists, oil scientists, vegetative specialists and watershed specialists.



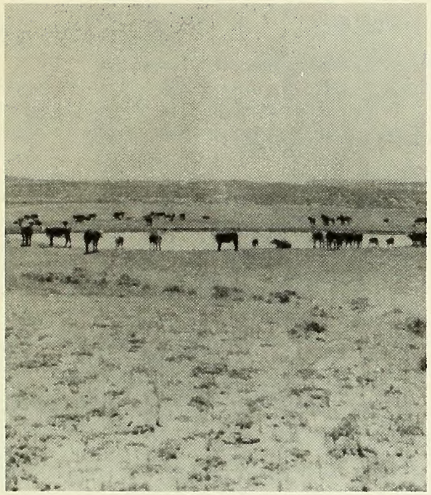






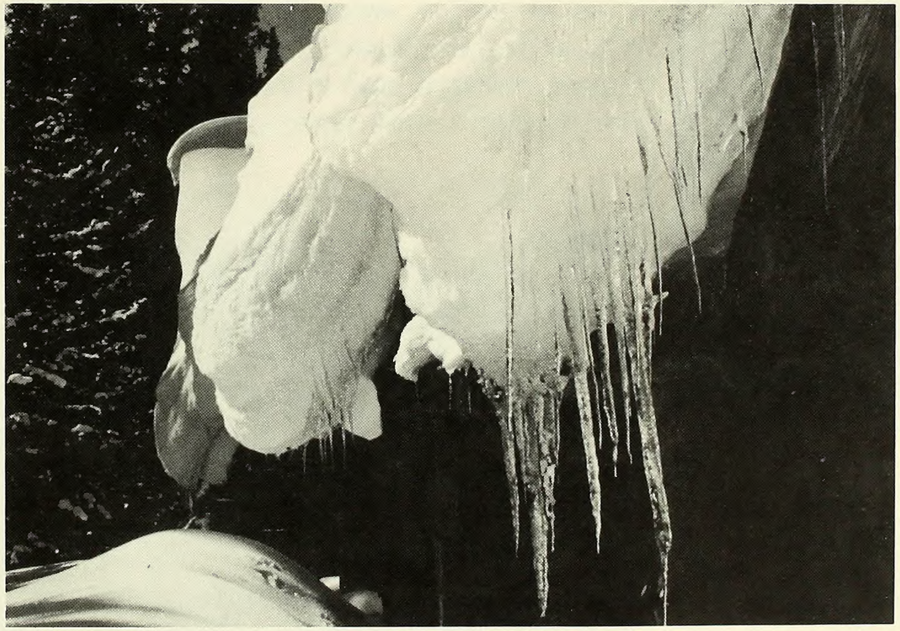


LOOKING TO THE FUTURE OF WYOMING



Today's water is the key to tomorrow's future in Wyoming. The state has always recognized water as one of its most important ways to help meet not only present but future water needs. Committed to the heritage of Wyoming, the Water Management Program exists to foster water in adequate supplies throughout the state—recognizing that water is an important link to Wyoming's past, key to its present, and resource for the future.

For more information, contact any of the BLM offices in Wyoming.



DEFINITION OF TERMS AND CONCEPTS

Hydrology is the study of how water occurs on Earth, and how it is circulated and distributed. It takes into account the chemical and physical make-up of the Earth's waters and how these waters relate to living things.

Applied hydrology, as it relates to BLM programs, is concerned primarily with the water resources of small drainage basins.

Watershed management involves the regulation of natural resources in a drainage basin. Every basin has unique problems that include such factors as fire, floods and erosion. The goal of watershed management is to control these problems and protect associated aesthetic values.

Water management deals with relationships between amounts of water produced and amounts used. Of major importance is how the quality, quantity and timing of water production affect both the watershed area and downstream sites where the water is used. Water management techniques are employed to minimize damage in either area. Proper management involves prescribing certain land uses, discouraging other types of use, and modifying existing uses.

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